

# Price Delegation in Sales Organizations: An Empirical Investigation

Ann-Kristin Hansen, Institute of Marketing, University of Münster, E-Mail: [a.hansen@uni-muenster.de](mailto:a.hansen@uni-muenster.de)

Kissan Joseph, School of Business, University of Kansas, E-Mail: [kjoseph@ku.edu](mailto:kjoseph@ku.edu)

Manfred Krafft, Institute of Marketing, University of Münster, E-Mail: [m.krafft@uni-muenster.de](mailto:m.krafft@uni-muenster.de)

## Abstract

*The allocation of decision rights is an integral component of designing organizational architecture. Economists have long understood the importance of co-locating decision rights with the knowledge that is valuable to those decisions. Following this prescription, marketing scholars have developed strong theoretical arguments in favor of delegating pricing authority to the sales force. Empirical work, however, reveals a significant number of sales organizations yielding only minimal authority to their salespeople. Given this divergence between theory and practice, we develop and empirically test two mitigating factors that could potentially explain why firms restrict pricing authority. We test our hypotheses on a sample of 222 German sales organizations and find that the data are generally consistent with our conceptualization.*

**Keywords:** pricing authority, delegation, determinants of price delegation, pricing, sales force management

## 1. INTRODUCTION

The allocation of decision rights is an integral component of designing organizational architecture (Brickley, Smith, and Zimmerman 2001). Economists have long understood the importance of co-locating decision authority with the knowledge that is valuable to those decisions. As early as 1945, Hayek highlighted the inability of centralized decision-makers to effectively solve organizational problems lower down in the hierarchy. More recently, Jensen and Meckling (1992) suggest that as long as agency problems are minimal, assigning decision rights to individuals, who have the decision-relevant knowledge, increases efficiency.

Marketing scholars have presented similar arguments in describing the allocation of pricing authority within sales organizations. Lal (1986) makes the case that delegating pricing authority to the sales force will be more profitable than centralization because salespeople often possess superior information about customer willingness-to-pay. Weinberg (1975) shows that salespeople, who are paid a commission based on realized gross margin and who are given control over price, will set prices so as to

maximize simultaneously their own income and the company's profits.

Surprisingly, despite these powerful theoretical arguments in favor of delegating pricing authority to the sales force, empirical work reveals a majority of sales organizations yielding little or no pricing authority to their salespeople. In a study conducted by Stephenson, Cron, and Frazier (1979) in the hospital-supplies industry, for example, 29% of firms yield no pricing authority and 48% yield only limited pricing authority. Only a minority of responding firms, namely 23%, give full pricing authority to their salespeople. Moreover, firms that centralize pricing authority are actually found to be more profitable than firms that delegate pricing authority.

Broadly, our objective in this research is to shed light on the observed divergence between theory and practice. More specifically, our research goals are two-fold: (i) identify factors that could potentially mitigate the optimality of delegating pricing authority to the sales force, and (ii) investigate the empirical validity of the proposed mitigating factors. In our research, we describe two mitigating factors that may cause centralization to be actually preferred over delegation. First, following the work of

Jensen and Meckling (1992), we posit that agency costs can potentially mitigate the benefits of delegating pricing authority to the sales force. Agency costs refer to the inefficiencies arising from a lack of perfect goal alignment between employees and owners, thereby lowering firm profit. The work by Joseph (2001) is particularly germane in this connection. His model reveals that salespeople have a tendency to make trade-offs between effort and price discounting that are inconsistent with the profit objective of the firm. Interestingly, this type of agency cost is also of great concern to practitioners. Specifically, sales managers complain that price latitude often causes salespeople to take the path of least resistance, i.e., use discounting rather than expend effort on selling (Stephenson, Cron, and Frazier 1979, p. 26). Given the possibility of such inefficient trade-offs, firms may withhold pricing authority even as they sacrifice the benefits of price customization obtained via delegation.

The second reason why centralization may be preferred to delegation pertains to the manner in which sales force control systems are designed. The design of control systems includes such elements as the choice of metrics utilized in the compensation plan, namely margins or sales, and the level of monitoring (Joseph and Thevaranjan 1998). Clearly, these control elements are designed not only to support the price delegation decision but also to respond to various other conditions facing the firm. For example, in some scenarios, the firm may wish to avoid setting commissions based on margins because such an action could reveal the firm's cost structure to the competition. This revelation could prove to be too costly from a strategic point of view (Churchill, Ford, and Walker 1997, p. 226). In such situations, a profit-maximizing firm is pushed towards centralization because incentives on sales provide no check on indiscriminate price discounting. Similarly, a firm faced with high monitoring costs may not be able to install an adequate number of supervisory personnel. This lack of supervision may prevent the firm from verifying if the salesperson is making the right trade-offs between effort and price; consequently, here also, centralization is the best strategy. In short, our essential point here is that the decision to delegate pricing authority will be influenced by the extant control system. Consequently, any study that examines the issue of delegating pricing authority to the sales force must explicitly take into account the nature of the overall control system.

In our empirical research, we investigate the manner in which pricing authority is delegated to the sales force in a sample of 222 German sales organizations spanning multiple industries. Like Stephenson, Cron, and Frazier (1979), we find considerable heterogeneity across firms with respect to this decision. Interestingly, we find that a significant proportion of firms, namely 28%, choose to yield *no* pricing authority to the sales force. In these cases, price is determined exclusively by management. Another 61% of the firms yield only limited pricing authority to their salespeople. Here, salespeople are allowed to set prices within a pre-specified range. Finally, only a relatively lower percentage of firms, namely 11%, follow the theoretical prescription of providing their salespeople with full pricing authority. In these cases, salespeople are given the freedom to set any price above marginal cost.

Our main empirical findings can be summarized as follows: The observed heterogeneity with respect to price delegation can be explained by the aforementioned mitigating factors. In particular, our proxies that identify conditions where firms are concerned about inefficient trade-offs between price delegation and effort are able to successfully predict the likelihood of price delegation. In addition, the nature of the control system also predicts the likelihood of price delegation.

Overall, these findings offer a more refined understanding of the price delegation decision. Early work in the marketing literature suggests that price delegation will invariably improve firm profits (Lal 1986; Weinberg 1975). The practitioner-oriented literature, on the other hand, has generally been more circumspect about delegating pricing authority to the sales force. For example, based on their consulting experience, Dolan and Simon (1996) comment that it seems to be better to err on the restrictive side, i.e., offer less pricing authority rather than too much pricing authority. They also report the practitioner sentiment that "letting the sales force set prices is about the same as hiring a fox to guard the hen house." Clearly, the mitigating factors proposed in this research have the potential to reconcile these divergent prescriptions.

The rest of the paper is organized in the following manner: In the next section, we review the literature and derive our hypotheses. We then explain our empirical strategy and describe the data and measures utilized in our empirical research. Next, we present our empirical findings and discuss the main

implications. Finally, we summarize our contributions and conclude by outlining directions for future research.

## 2. LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESES

### 2.1 Literature Review

Joseph (2001) considers the impact of two forces that could potentially influence the optimality of price delegation. On the one hand, providing pricing authority to individual salespeople empowers them to use their superior information about customer willingness-to-pay and thereby conclude a greater number of transactions. On the other hand, providing the salesperson with pricing authority could lead to sub-optimal trade-offs between effort and price discounting. Given these opposing considerations, Joseph's primary objective is to examine the net effect of these two forces in determining the optimal level of pricing authority. His analysis reveals that limiting pricing authority can, in some environments, reduce the sub-optimal trade-off between price discounting and effort. In effect, limiting pricing authority forces the salesperson to expend greater effort on prospecting because shirking on this task cannot be offset by price discounting. As such, the benefit obtained from inducing greater effort on prospecting outweighs the loss arising from the inability to customize prices.<sup>1</sup>

Of course, other work in marketing has also examined the price delegation decision. Bhardwaj (2001) considers the strategic impact of the price delegation decision. In particular, he examines how competition impacts the price delegation decision. Our investigation differs from his analysis in that he does not consider the price-customization advantages of price delegation. That is, the issue of customizing prices across customers is not considered in his model – when the rep has pricing authority, he (or she) sets a single price for the entire market. Mishra and Prasad (2004) also consider the issue of price delegation and conclude that centralized pricing performs at least as well as price delegation.

Mishra and Prasad (2005) demonstrate similar implications in a competitive setting. Although this is in contrast to Lal's (1986) result, it arises because Mishra and Prasad assume a different timing of information. In particular, in their work, the private information of the rep is garnered at the time of contracting; consequently, an appropriate contract is able to elicit this information. In contrast to the efforts of Mishra and Prasad, we follow the work of Lal (1986) and consider a context where the private information is obtained after the time of contracting when salespeople actually call on their clients.

### 2.2 Development of Hypotheses

As suggested previously, there are two mitigating factors which may negate the price-customization advantages of price delegation, namely agency costs and the overall nature of the control system. We next develop hypotheses pertaining to these two factors.

#### *Impact of Agency Costs on Price Delegation*

Since our hypotheses here depend heavily on the work of Joseph (2001), it is instructive to review it in some detail. In his model, the market consists of two segments: A and B. Customers belonging to Segment A have reservation values that are independently distributed and come from the uniform distribution  $[1-\delta, 2-\delta]$ . Customers belonging to Segment B have reservation values that are also independently distributed but come from the uniform distribution  $[0, 1]$ . Evidently, there is some overlap between the two segments, A and B. In particular, there are some customers in both segments whose valuations lie in the interval  $[1-\delta, 1]$ . The parameter  $\delta$  thus represents the overlap between the two segments. Its expected values will be greater than 0 but substantially less than 1. Obviously, customers in Segment A comprise the firm's target segment because they tend to have higher reservation values in general. As such, the firm will encourage the salesperson to identify and pursue customers belonging to this segment (prospecting). Now, high values of  $\delta$  suggest that the two segments merge with respect to their reservation values which is likely to be the case in a highly competitive environment. In particular, due to the availability of several substitute goods, the reservation values of both segments converge. In contrast, low values of  $\delta$  describe a distinct segment that is willing to pay

<sup>1</sup> From a technical point of view, Joseph (2001) obtains these effects because he allows the effort devoted to prospecting to influence the type of customer (high valuation or low valuation) that the salesperson encounters. This is in contrast to Lal's work wherein the price sensitivity of the sales response function is better observed by the salesperson, but not influenced by the effort choices of the salesperson.

higher prices for the firm's offering which is more characteristic for a low competitive landscape because of the absence of alternative suppliers. Following these explanations,  $\delta$  is interpreted as a measure of competitive intensity.

In this context, the effort  $\phi$  expended by the salesperson is assumed to impact the quality of prospecting. Specifically, as the salesperson expends greater effort on prospecting, a greater fraction of the customers encountered by the salesperson are drawn from Segment A. This is because the more time the salesperson devotes to market analysis in terms of identifying potential customers based on demographic or situational factors, the higher the likelihood that potential customers are classified correctly as Segment A customers. Clearly,  $\phi$  can take on values between 0 (minimum effort) and 1 (maximum effort). Hence, given effort level  $\phi$  on prospecting and a cohort of  $N$  customers,  $N\phi$  customers are drawn from Segment A.

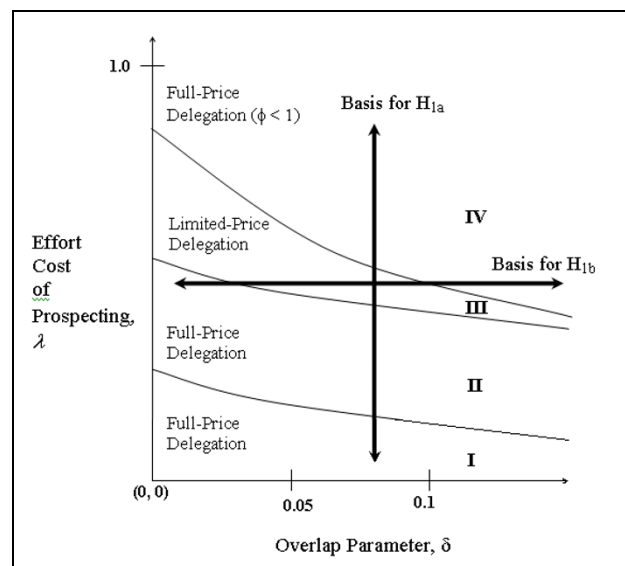
Since  $\phi \in [0,1]$ , the remaining  $N(1-\phi)$  customers are drawn from Segment B. Within the model, the parameter  $\lambda$  scales the effort cost of prospecting, which is expressed as  $\lambda\phi^2$ .<sup>2</sup> Clearly,  $\lambda$  determines how expensive prospecting effort is – a given level of prospecting effort incurs greater effort cost in those environments where  $\lambda$  is higher.

Following this analysis, the main insight offered by Joseph (2001) is as follows: He finds that price delegation is not optimal in all parts of the parameter space. Specifically, for a given value of the competitive intensity parameter,  $\delta$ , the optimality of delegating pricing authority varies nonmonotonically with the effort cost of following a high-quality prospecting strategy. In particular, when  $\lambda$  is relatively high or relatively low, delegating pricing authority to the sales force is the optimal strategy. However, when  $\lambda$  takes on intermediate values, limiting pricing authority is the optimal strategy (please see basis for  $H_{1a}$  arrow in Figure 1, taken from Joseph (2001)).

The intuition behind this finding is as follows: When  $\lambda$  is relatively low, the salesperson is willing to invest effort on prospecting because prospecting is not that expensive in terms of effort costs. In this situation, there is no divergence in preferences between the firm and the salesperson with respect to the amount of effort that ought to be devoted to prospecting. As

such, the firm yields pricing authority to the salesperson in order to obtain the benefits of price customization. Similarly, when  $\lambda$  is relatively high, both the firm and salesperson are in agreement that not much effort should be devoted to prospecting – this activity is expensive in terms of effort costs. As such, here also, the firm yields pricing authority to the salesperson in order to obtain the benefits of price customization. However, when  $\lambda$  takes on intermediate values, the salesperson's preferred trade-off between effort and price is different from that of the firm's. In particular, the salesperson prefers to substitute price discounting for effort whereas the firm prefers that this substitution not be done. Thus, in this instance, the firm is better off limiting the extent of pricing authority. This limitation, in turn, forces the salesperson to invest a sufficient amount of effort on prospecting.

**Figure 1. Optimality of Price Delegation**



For our purposes, the model analyzed by Joseph (2001) can be examined closely to obtain an additional insight. Specifically, by looking at the output of the model, it is also apparent that for a given value of the parameter  $\lambda$ , the optimality of delegating pricing authority varies nonmonotonically with the competitive intensity parameter,  $\delta$ . Thus, when  $\delta$  is relatively high or relatively low, delegating pricing authority to the sales force is the optimal strategy. However, when  $\delta$  takes on intermediate values, limiting pricing authority is the optimal strategy (please see basis for  $H_{1b}$  arrow in Figure 1).

<sup>2</sup> Effort cost is the monetary equivalent of the disutility incurred from effort (see also Basu, Lal, Srinivasan, and Staelin 1985).



Although this is a new insight, the intuition behind it is very similar to the previous case. When  $\delta$  is relatively small, the salesperson is willing to invest effort on prospecting because the degree of competitive intensity is small and any effort expended on prospecting yields Segment A customers who are, in this instance, distinct from Segment B customers. As such, there is no divergence in preferences between the firm and the salesperson with respect to the amount of effort that ought to be devoted to prospecting. Consequently, the firm yields pricing authority to the salesperson in order to obtain the benefits of price customization. Similarly, when  $\delta$  is relatively large, competitive intensity is high and both the firm and salesperson are in agreement that not much effort should be devoted to prospecting. Given the high overlap between the segments, prospecting does not yield customers who are willing to pay much higher prices than Segment B customers. As such, here also, the firm yields pricing authority to the salesperson in order to obtain the benefits of price customization. However, when  $\delta$  takes on intermediate values, the salesperson's preferred trade-off between effort and price is different from that of the firm's. Again, the salesperson prefers to substitute price discounting for effort whereas the firm prefers that this substitution not be done. Thus, in this instance, the firm is better off limiting the extent of pricing authority. This limitation, in turn, ensures that the salesperson invests sufficient amounts of effort on prospecting. Overall, this discussion suggests that the price delegation decision will vary non-monotonically in the parameters  $\lambda$  and  $\delta$ . This leads to our first set of hypotheses:

- H<sub>1a</sub>:** When prospecting is relatively expensive or relatively inexpensive in terms of effort costs, agency costs are muted and the likelihood of delegating pricing authority is expected to be high. However, when prospecting is moderately expensive in terms of effort costs, agency costs are salient and the likelihood of delegating pricing authority is expected to be low.
- H<sub>1b</sub>:** When competitive intensity is relatively low or relatively high, agency costs are muted and the likelihood of delegating pricing authority is expected to be high. However, when competitive intensity takes on inter-

mediate values, agency costs are salient and the likelihood of delegating pricing authority is expected to be low.

### ***Impact of Control System Elements on Price Delegation***

As mentioned previously, the design of the control system is likely to be influenced by several factors. Typically, the control system is designed not only to support the price delegation decision but also to accommodate various conditions facing the firm such as task programmability, environmental uncertainty, risk preferences, etc (Basu, Lal, Srinivasan, and Staelin 1985; Anderson and Oliver 1987). Two important elements of the control system include the performance metrics employed by the firm (sales or margin) and the extent of managerial monitoring. First, consider the impact of utilizing incentives based on gross margins. We posit that the use of incentives based on gross margins in the control system will increase the likelihood of delegating pricing authority. This is because offering incentives on gross margins (as opposed to sales revenue) ensures that any reduction in price strongly affects the compensation of the salesperson. To illustrate this point, consider a product with a list price of € 100 and marginal cost of € 90. If the salesperson is compensated on sales with a commission rate of 1%, a sale at list price yields € 1 in income. Discounting the product to € 95 leads to commission income of € 0.95 – a decrease of only 5 cents. On the other hand, if the salesperson is compensated on realized gross margins with commission rate of 10%, a sale at list price yields € 1 in income. Discounting the product to € 95 leads to commission income of € 0.50, a decrease of 50%. Clearly, incentives based on realized gross margins can substantially reduce the motivation to indiscriminately lower price. Next, consider the impact of the cost of monitoring (Joseph and Thevaranjan 1998). Monitoring can significantly reduce the ability of the salesperson to engage in sub-optimal trade-offs between effort and price. In other words, managerial monitoring can ensure that the salesperson does not misuse pricing authority. This discussion involving the control system leads to our second set of hypotheses:

- H<sub>2a</sub>:** The utilization of incentives based on gross margins in the control system will increase the likelihood of delegating pricing authority to the sales force.

**H<sub>2b</sub>:** A high intensity of monitoring in the control system will increase the likelihood of delegating pricing authority to the sales force.

### 3. EMPIRICAL STRATEGY, DATA, MEASURES, AND ESTIMATION EQUATION

#### *Empirical Strategy*

We now describe the essential features of our empirical strategy. Guided by the trade-offs contained within our first hypothesis, we first identify conditions wherein sub-optimal trade-offs between effort and price are likely to occur. We then expect these conditions to predict instances wherein firms are likely to restrict pricing authority. Our second hypothesis is tested in straightforward fashion by examining the impact of control system elements on the likelihood of price delegation.

We employ proxies to test the effects described within our hypotheses. Broadly, in this approach, a case is made for an observable variable to represent the conditions described within the hypotheses (see, for example, the empirical work by [Coughlan and Narasimhan 1992](#) on sales-force compensation plans). Then, the data are analyzed to examine if the proxies behave in a manner suggested by the proposed conceptualization.

#### *Data*

We utilize data collected by [Krafft \(1999\)](#) in his study pertaining to sales-force control systems. His data were obtained via a mail survey of 1,099 chief sales executives of German sales forces (for details, see [Krafft 1999](#) or [Krafft, Lal, and Albers 2004](#)). A second mailing followed the initial mailing four to six weeks later. The survey was completed approximately twelve weeks after the first mailing and resulted in a response rate of 24.6%. This sample is characterized by large firms and comprises observations from the financial-services sector, pharmaceutical-goods firms, industrial-goods companies, and the consumer-goods industry. The average annual sales volume in the data set is € 148.9 million. A comparison of the sample with other German studies shows that this data set corresponds well with typical levels of annual sales, sales-force size, age, tenure, and total pay.

#### *Dependent Variable*

The survey measures the extent of pricing authority given to the sales force via the question, “The general pricing authority of your salespeople is” followed by the choices, “0: No pricing authority (prices are determined by the management,” “1: Restricted (salesperson determines prices within a pre-specified range),” and “2: Unrestricted (salesperson has full authority).”

#### *Proxies for $\lambda$ and $\delta$*

As discussed previously, we employ proxies to capture the hypothesized effects of the parameters  $\lambda$  and  $\delta$ . With respect to the parameter  $\lambda$ , the survey provides information about the fraction of time spent on: (i) sales calls, (ii) activities such as call preparation, merchandising, and service, (iii) travel / waiting. Recall that the parameter  $\lambda$  reflects the effort cost of perfectly targeting a customer in the firm’s target segment. While items (ii) and (iii) do not strictly measure prospecting, they are a gauge of the host of activities required to identify and pursue target customers. Sales processes that require higher levels of call preparation, merchandising, service, and even travel/waiting all imply greater effective cost to identify and pursue a prospect in the firm’s target segment. As such, we employ the sum of (ii) and (iii) to serve as a proxy for  $\lambda$ .

From a measurement point of view, however, the response pertaining to the proportion of time spent on sales calls (item (i)) is likely to be the most accurate. This is because it is often recorded in call logs. In addition, sales managers are likely to be very conscious of this fraction since it is frequently used for decisions regarding sales-force sizing and specialization (see, for example, [Moriarty and Swartz 1986](#)). Thus, we measure the effort cost of prospecting-type activities by 100 less the fraction of time devoted to the actual sales call. In our sample, the fraction of effort devoted to prospecting varies from 30% to 100%. The two observations that take values greater than 95% are likely to be described by support salespeople rather than field salespeople. Nevertheless, they also serve as useful observations to test our expectation here that the firm would like to offer pricing authority to the sales force. This is because the opportunity to make sub-optimal trade-offs between effort and price simply does not arise.

With respect to the parameter  $\delta$ , the survey measures INTENSITY OF COMPETITION via the

question: “How strong do you perceive the intensity of competition in your market segment?” The responses to this question are coded via a 7-point semantic differential scale going from Low to High.

### **Utilization of Incentives Based on Gross Margins**

The survey also reports the utilization of incentives based on gross margins. In straightforward fashion, we employ a dummy variable which takes the value 1 if such incentives are utilized, 0 otherwise. Overall, in our sample of firms, only about 18% of firms employ incentives based on gross margins although approximately 72% offer some amount of pricing authority to their salespeople. This empirical finding underscores the importance of including elements of the control system.

### **Intensity of Monitoring**

In straightforward fashion, we measure the intensity of monitoring via the number of salespeople supervised by the sales manager. We assume that the greater the number of salespeople monitored by a sales manager, the lower is the intensity of monitoring. Since we further suppose that the impact of a unit increase in sales-force size is larger at relatively small sales-force sizes – and hence an r-shaped relation is expected – we use a square-root transformation for this variable.

### **Calls to Close**

For proper specification, we also include the number of calls required to close a sale in our model. Firms characterized by long selling cycles are likely to be promoting products that are intrinsically complex. Such products may inherently require a good deal of negotiation. For this reason, we expect length of the selling cycle to increase the likelihood of delegating pricing authority to the sales force (see [Stephenson, Cron, and Frazier 1979, p. 21](#)). CALLS TO CLOSE is measured via the question, “How many sales calls are necessary in cases of first purchases to close a sale?”

### **Estimation Model**

Following our discussion, we specify the following model for estimation purposes:

$$(1)^3 \text{ Probability (Delegating Pricing Authority)} = \frac{1}{1 + e^{Z_i}}$$

$$(2) \quad \text{with } Z_i = \beta_{0i} + \beta_1 \times \text{PROSPECTING FRACTION} + \\ \beta_2 \times (\text{PROSPECTING FRACTION})^2 + \\ \beta_3 \times \text{INTENSITY OF COMPETITION} + \\ \beta_4 \times (\text{INTENSITY OF COMPETITION})^2 + \\ \beta_5 \times \text{UTILIZATION OF GROSS MARGIN INCENTIVES} + \\ \beta_6 \times \text{INTENSITY OF MONITORING} + \\ \beta_7 \times \text{CALLS TO CLOSE}$$

and  $i$  = category of delegated pricing authority (no vs. limited vs. full)

The powered terms in equation (2) allow us to test the non-monotonic relationships developed in hypotheses  $H_{1a}$  and  $H_{1b}$ . Following our hypotheses, we expect  $\beta_1 < 0$ ,  $\beta_2 > 0$ ,  $\beta_3 < 0$ ,  $\beta_4 > 0$ ,  $\beta_5 > 0$ , and  $\beta_6 > 0$ .

## **4. FINDINGS AND DISCUSSION**

Table 1 provides the overall characteristics of our sample with respect to the dependent and independent measures (by industry). Table 2 reports the correlation matrix of our analysis variables. Table 2 suggests that multi-collinearity – with the exception of the correlations between powered and dedicated non-powered terms – is not an issue in our study. Despite the multi-collinearity between powered and non-powered terms we integrate the squared terms into our model because both terms add significantly to the overall explanatory power of our model. As compared to a reduced model (with Log Likelihood = -181.43) that does not include the variables (PROSPECTING FRACTION)<sup>2</sup> and (INTENSITY OF COMPETITION)<sup>2</sup>, the model that includes all of our independent variables has significantly higher fit (the improvement  $\chi^2 = 8.615$ ,  $p < .05$ ). This significant improvement confirms our assumption that powered and non-powered terms of PROSPECTING FRACTION and INTENSITY OF COMPETITION are necessary to estimate the dependent variable. We note that including powered terms does not change the remaining variables of

<sup>3</sup> For  $i=0$ , equation (1) describes the probability that firms delegate full or limited (vs. no) pricing authority. For  $i=1$ , equation (1) describes the probability that firms delegate full vs. limited or no pricing authority.

our model with regard to direction or significance levels of the coefficients.

**Table 1: Means Across Industries  
(standard deviations of independent  
variables by industry in parentheses)**

	Financial Services	Pharmaceutical Companies	Consumer Goods	Industrial Goods
Percent of Firms with Full Price Delegation	.07	.10	.14	.13
Percent of Firms with Limited Price Delegation	.36	.55	.6	.82
Prospecting Fraction	62.03 (12.35)	71.56 (13.38)	66.82 (14.21)	67.66 (13.89)
Intensity of Competition	5.70 (.93)	5.91 (1.18)	5.76 (1.46)	5.94 (1.19)
Utilization of Gross Margin Incentives	.19 (.39)	.15 (.36)	.16 (.37)	.21 (.41)
Intensity of Monitoring	10.70 (10.94)	8.82 (3.14)	9.07 (6.32)	8.44 (5.19)
Calls to Close	2.77 (1.54)	3.11 (1.99)	3.10 (2.29)	5.35 (3.23)
Number of Observations	47	33	75	67

**Table 2: Correlation matrix of independent  
variables (p-values in parentheses)**

	Prospecting Fraction	Prospecting Fraction <sup>2</sup>	Utilization of Gross Margin Incentives	Intensity of Monitoring	Calls to Close	Intensity of Competition	Intensity of Competition <sup>2</sup>
Prospecting Fraction	1.00 (0.00)						
Prospecting Fraction <sup>2</sup>	0.99** (0.00)	1.00 (0.00)					
Utilization of Gross Margin Incentives	-0.01 (0.46)	-0.01 (0.43)	1.00 (0.00)				
Intensity of Monitoring	-0.16** (0.01)	-0.14* (0.02)	-0.19** (0.00)	1.00 (0.00)			
Calls to Close	0.09 (0.11)	0.09 (0.1)	0.08 (0.12)	-0.11* (0.05)	1.00 (0.00)		
Intensity of Competition	0.08 (0.12)	0.09 (0.09)	0.08 (0.13)	-0.23** (0.00)	0.13* (0.03)	1.00 (0.00)	
Intensity of Competition <sup>2</sup>	0.07 (0.17)	0.08 (0.13)	0.09 (0.09)	0.24 (0.00)	0.13* (0.03)	0.99** (0.00)	1.00 (0.00)

\*\* : Significant at the 0.01 level    \* : Significant at the 0.05 level    N=222

We next report findings from running our model as specified in (1) and (2). Since the dependent variable is ordinal scaled and its potential categories can be ordered, we employ an ordered regression model for our estimation (Long and Freese 2006). We use a logit model because the logistic distribution fits our

assumed distribution of the residuals best. Further reasons for preferring a logit model to probit are that both distributions tend to lead to similar results, and probit has found rather limited application in association with ordered models while logit models are widely used (Greene 2003). The findings of our estimation are reported in Table 3, and we note that – with the exception of the variable UTILIZATION OF GROSS MARGIN INCENTIVES – all coefficients are significant at the 0.05 level or higher.

As hypothesized, we do find that the fraction of effort devoted to prospecting has a non-monotonic impact on the probability of delegating pricing authority to the sales force. Firms at which the sales process is characterized by relatively low or relatively high cost of prospecting tend to delegate pricing authority to the sales force. On the other hand, firms at which the sales process is characterized by intermediate levels for the cost of prospecting tend to limit the extent of pricing authority given to their salespeople. Similarly, we find that the intensity of competition displays the hypothesized effects. Specifically, we find that competitive intensity first decreases and then increases the extent of pricing authority given to the sales force. *Taken together, these findings provide strong support for our primary hypothesis that agency costs can mitigate the*

*price-customization advantages of delegation.*

The hypothesized effect that the use of incentives based on gross margins increases the likelihood of delegating pricing authority to the sales force is not supported by our model.



One might speculate that this finding is affected by the categorical nature of our dependent variable – our largest sub-sample of sales forces with restricted price delegation entails cases with low to high (but not full) degrees of pricing authority. The non-significant effect could then be a consequence of a leveling effect: firms with high degrees of delegation that base their incentives on gross margins, are within the same category as firms with very restricted pricing authority that do not apply incentives based on gross margins. This argument can be underlined by our results from a logistic regression where only cases with full vs. no delegation are considered. Though not significant due to low sample size ( $n=87$ ), firms using incentives based on gross margins are more likely to fully delegate pricing authority (see Table 4).

**Table 3: Determinants of Delegating Pricing Authority (three groups, ordered regression, p-values in parentheses)**

Variable	Expected Sign	Estimate
<b>Prospecting Fraction</b>	-	- 0.148** (0.037)
<b>(Prospecting Fraction)<sup>2</sup></b>	+	+ 0.0013** (0.023)
<b>Intensity of Competition</b>	-	- 1.594*** (0.009)
<b>(Intensity of Competition)<sup>2</sup></b>	+	+ 0.147** (0.013)
<b>Utilization of Gross Margin Incentives</b>	+	- 0.008 (0.492)
<b>Intensity of Monitoring (R, Square root transformation)</b>	-	- 0.569*** (0.001)
<b>Calls to Close</b>	+	+ 0.208*** (0.000)
Log likelihood		-177.123
$\chi^2$ (Likelihood-Ratio Test)		40.567*** (degrees of freedom: 7)
Nagelkerke		0.2
***: Significant at the 0.01 level (one-tailed) **: Significant at the 0.05 level (one-tailed) *: Significant at the 0.1 level (one-tailed) R: reversed measure N=222		

Next, we find that the intensity of monitoring also has a significant impact on the probability of delegating pricing authority to the sales force. Firms that monitor their salespeople intensely are relatively more likely to delegate pricing authority to the sales force. *As postulated, these findings suggest that the*

*nature of the control system has a significant bearing on the price delegation decision.*

To account for the fact that the nature of the selling process may also influence the extent of pricing authority delegated to the sales force, we integrated the variable CALLS TO CLOSE as a covariate. As expected, we find that firms characterized by long selling cycles are more likely to delegate pricing authority to their salespeople.

**Table 4: Determinants of Delegating Pricing Authority (two groups, logistic regression, p-values in parentheses)**

Variable	Expected Sign	Estimate
<b>Prospecting Fraction</b>	-	- 0.269 (0.103)
<b>(Prospecting Fraction)<sup>2</sup></b>	+	+ 0.002* (0.073)
<b>Intensity of Competition</b>	-	- 2.726*** (0.005)
<b>(Intensity of Competition)<sup>2</sup></b>	+	+ 0.258*** (0.009)
<b>Utilization of Gross Margin Incentives</b>	+	- 1.114 (0.136)
<b>Intensity of Monitoring (R, Square root transformation)</b>	-	- 1.311*** (0.006)
<b>Calls to Close</b>	+	+ 0.467*** (0.001)
Log likelihood		-35.13
$\chi^2$ (Likelihood-Ratio Test)		32.234*** (degrees of freedom: 7)
Nagelkerke		0.4
***: Significant at the 0.01 level (one-tailed) **: Significant at the 0.05 level (one-tailed) *: Significant at the 0.1 level (one-tailed) R: reversed measure N=87		

Finally, we also report findings from estimating our model with logistic regression by excluding the middle group (delegating restricted price authority) and findings from ordered regression estimation for equally sized groups. The logistic regression (results are reported in Table 4) is based on zero ( $n=63$ ) vs. full ( $n=24$ ) delegation and confirms our findings. Due to limited sample size, some of the coefficients are not significant, but in the proposed direction. In Table 5, we report results from a balanced sample (24 cases for no, restricted and full delegation – for no and restricted delegation, we took a random sample of the 63 and 135 cases). Again, the results are quite similar. We only find some non-significant

relationships because of limited sample sizes. Overall, the results of the two additional estimations suggest that the findings of our model are robust and thus confirm that our results as reported in Table 3 are reliable.

**Table 5: Determinants of Delegating Pricing Authority (three groups of same size, ordered regression, p-values in parentheses)**

Variable	Expected Sign	Estimate
Prospecting Fraction	-	- 0.073 (0.342)
(Prospecting Fraction) <sup>2</sup>	+	+ 0.001 (0.253)
Intensity of Competition	-	- 4.607*** (0.004)
(Intensity of Competition) <sup>2</sup>	+	+ 0.454*** (0.003)
Utilization of Gross Margin Incentives	+	- 0.305 (0.380)
Intensity of Monitoring (R, Square root transformation)	-	- 0.412* (0.089)
Calls to Close	+	+ 0.486*** (0.001)
Log likelihood		-57.105
χ <sup>2</sup> (Likelihood-Ratio Test)		42.605*** (degrees of freedom: 7)
Nagelkerke		0.5
***:	Significant at the 0.01 level (one-tailed)	
**:	Significant at the 0.05 level (one-tailed)	
*:	Significant at the 0.1 level (one-tailed)	
R:	reversed measure	
N=72		

## 5. CONTRIBUTIONS AND IMPLICATIONS

In very many markets, customers vary significantly in their valuation of the firm's offerings. In these cases, managers need to decide *whether* and *how much* pricing authority should be delegated to the sales force. Our work illuminates the economic trade-offs involved in this decision.

Substantively, our empirical findings suggest that although price delegation can yield tremendous advantages, this latitude gives rise to the possibility of a specific type of agency cost, namely, the sub-optimal substitution of selling effort by price discounting. A key finding in our empirical work is that firms are less likely to delegate pricing authority when these agency costs are likely to be fairly substantial. This finding demonstrates that the price-customization advantages of price delegation need

to be weighed against the magnitude of the agency costs that are likely to emerge. In our empirical work, we find that these agency costs can be substantial when the proportion of effort devoted to prospecting-type activities and the degree of competitive intensity take on intermediate levels. Clearly, these conditions are not transparent; consequently, these implications have the potential to be fairly insightful.

A second substantive finding pertains to the impact of the control system on the price delegation decision. We find that firms that closely monitor their sales personnel can minimize sub-optimal substitution of selling effort by price discounting. Thus, these firms can potentially benefit from delegating pricing authority to their sales personnel. Conversely, firms that employ low levels of supervision may restrict pricing authority because they suffer from an inability to limit agency costs. These firms thus cannot take advantage of the price-customization advantages of delegation.

Based on the assumption that a firm's decision against price delegation is influenced by some mitigating factors that make not delegating optimal for them, our research suggests that the decision to delegate pricing authority yields the advantages of price-customization benefits but is fraught with agency costs. However, to get a broader understanding of the optimality of the price delegation decision, future research should more thoroughly investigate the relationship between the degree of pricing authority and performance. Furthermore, additional research is required to verify the impact of the mitigating factors with more precise dependent variables and direct measures rather than the proxies that we employ in the current research. Additional research is also required to examine how technology (e.g., sales-force automation) can impact the delegation decision. Finally, future research could also examine heterogeneity in the price delegation decision *within* a salesforce (by levels of experience, product lines, etc). We hope our research will stimulate such efforts.

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## Biographies

**Ann-Kristin Hansen** is doctoral student at the Institute of Marketing at the Westphalian Wilhelms University of Muenster in Germany. After finishing her degree in business studies (majors: marketing, sales and supply chain management) in 2006, she has been employed as research assistant at the Institute of Marketing. Her research interests focus on delegation of pricing authority to sales people and the Marketing-Sales interface.

**Kissan Joseph** is Associate Professor and Stockton Research Fellow at the University of Kansas. He obtained his Ph. D. in Marketing from Purdue University in 1992. His research interests include pharmaceutical marketing, e-marketing, pricing, advertising budgeting, and sales force compensation. His research has appeared in the *Journal of Marketing*, *Marketing Science*, *Marketing Letters*, *Industrial Marketing Management*, *Managerial and Decision Economics*, and the *Southern Economic Journal*.

**Manfred Krafft** is Professor and Director of the Institute of Marketing at the Westphalian Wilhelms University of Muenster in Germany since 2003. Postdoctoral, he was employed as Assistant Professor of Marketing at the Institute of Marketing, University of Kiel. After finishing his Habilitation (2nd dissertation) with a thesis on "Customer retention and customer value" in 1999, he was endowed the Otto Beisheim Chair of Marketing at the Koblenz Graduate School Management in Germany. His main research interests focus on topics related to customer relationship management, direct marketing and sales management. His research has appeared in the *Journal of Marketing*, *Marketing Science*, *Journal of Marketing Research*, *International Journal of Research in Marketing* and *Interfaces*.